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ABSTRACT

The hypothesis (Kelly, 1968) that, in a fluid school setting, students with a high preference for exploration would adapt more easily than low explorers, while in a constant school environment the opposite would be the case, was examined. A sample of 120 eighth-grade boys selected to represent low, moderate, and high exploration groups were followed as they progressed through two large suburban high schools. The first high school (with a population exchange rate of 19%) had a relatively fluid social environment, while the second high school (with a 7% rate of population turnover) had a relatively constant social environment. Two-way analysis of variance found significant School x Exploration Interaction in the hypothesized direction for twelfth-grade measures of psychosomatic symptoms of self-dissatisfaction. An investigation of assumptions found that in the more fluid setting high explorers reported a greater degree of affective interaction and instrumental interaction with peers and school staff than did low explorers, but in the more constant setting this was not the case. The implications of these findings for school intervention strategies were discussed in terms of a theory of person-environment interaction. (Author)

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Exploration and Adaptation in Varied High School Environments

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Exploration and Adaptation in Varied High School Environments

Person-environment interaction as a strategy for understanding human behavior was pioneered in the work of Kurt Lewin (1935) and Henry Murray (1938). Yet while Lewin's formulation, B=f(P,E), is now a maxim in psychology, the specific nature of the interaction between person and environment in different contexts is often unclear (Stern, 1970, Kulka, 1975). In an effort to extend these principles into a practical basis for mental health consultation, this study investigated how the coping style of individuals helped determine their adaptation to different social settings. Specifically, the study investigated whether exploration -- "preference for participation in novel social situations"--might be an example of a coping style that could influence the adaptation of students in different high school environments.

Exploratory behavior has been seen in a variety of species (Welker, 1961), and evidence suggests that a predisposition to explore is intrinsic to all organisms, although there are individual differences in the strength of this action tendency (Berlyne, 1963). Exploration has been viewed then as "adaptive, environmental engaging behavior which facilitates an organism's coping with situations" (Edwards, 1971, p. 15). Collaborative evidence from the Berkeley Guidance Study highlights the influence of exploratory preference during adolescence; Livson and Peskin (1967, p. 54) found that "a confident inquiring orientation" in 11-13 year old girls and "an outgoing approach to social experience" in the same age boys predicted psychological health in adulthood.

Accordingly, it was felt that exploratory preferences might have a significant influence on the adaptation of students to the high school environment.

On the environmental side, Kelly (1968) suggested that the rate of population exchange in a school (the rate of turnover in the student body) might play a key role in the adaptation of students to the school environment. It was predicted that a school with a high rate of population exchange would be characterized by a fluid environment which would have a large number of shifting, informal social settings, and a high rate of interpersonal interactions. Such an environment might encourage such behaviors as analysis of alternatives, planning activities, and scouting for new resources. In contrast, a school with a low rate of population exchange would be a more constant environment with fewer but more formal social settings and a lower rate of interpersonal interaction. Such a school might have stronger norms for conformity, so that "citizen" behaviors, such as facilitation and execution of solutions, might prove to be adaptative.

Accordingly it was hypothesized that: persons who prefer exploration as a mode for coping with the environment will be congruent with a more fluid, high exchange setting and therefore will adapt better to that environment than to a more constant, low exchange setting; low explorers will adapt better in a more constant, low exchange setting than in a more fluid, high exchange environment. This prediction was made because it was felt that in a fluid school environment, high explorers would be more apt than low explorers to: (1) seek out and

develop positive relationships with school adults; (2) seek out and develop positive relationships with peers; and (3) become more involved in classes and school activities. Conversely, in a more constant school environment it was felt that low explorers would be just as apt as high explorers to develop positive relationships with school adults and peers and to become involved in classes and school activities. Further, it was felt that in a constant school setting high explorers would be more apt to resent the structure of the school and be labeled as deviant by school staff.

Testing Hypotheses

Method

The sample. The sample consisted of 120 boys -- 20 high, 20 moderate, and 20 low explorers in each of two large suburban high schools--who were followed from eighth grade to graduation from high school in 1973. The sample was selected on the basis of peer ratings and a 102 item Exploration Preference Questionnaire (Edwards, 1971) which was administered to the population of 595 eighth grade boys in the two school systems. The questionnaire contained true-false items such as, "I go out of my way to take part in different activities", "I ask a question even when it might seem silly," and "I like to meet new people as often as I can." The test-retest reliability of the questionnaire was .82 after a two-week lapse and .67 after a one year interval; the coefficient alpha measure of internal consistency (Cronbach, 1951) was

.85. Self-ratings on the exploration questionnaire were significantly correlated with ratings obtained by peer nominations and thematic measures. Scores on the exploration questionnaire were relatively independent of a student's grades, IQ, socioeconomic status, and the Marlowe-Crowne index of social desirability (Kelly, 1978). The groups were selected so that the cutoffs for the high and low groups were set at two standard errors plus two units (the average regression effect estimated from parallel forms) above and below the mean.

Edwards (1971) found that high explorers were more likely to take initiative in social situations and were less likely to experience interpersonal difficulties than low explorers. Barbara Newman (1971) found that boys who showed a greater preference for exploration also tended to initiate more discussion, demonstrate more affect, and engage in more group leadership. Gilmore (1972) found that high explorers were more likely to express competencies within the framework of the school. In short, exploration seemed to reflect both a preference for diversity and novelty of experiences and a tendency to adopt an outgoing and interpersonally active style in seeking such experiences within the school environment; as such, it was expected to have significant impact on the ways young people adapt to high school.

The schools. The two large suburban high schools were selected on the basis of population exchange rate so that School A had a higher rate of student turnover (19% a year) than School B (7% a year). The schools were similar in terms of course offerings and faculty experience (Kelly, et al., 1978). There were, though, some differences in the socio-

economic levels of the two communities; School A served a working class community where 61% of family heads held blue collar jobs and the median family income was $11,900 in 1970; School B was located in a residential community where 57% of family heads held white-collar jobs and the median family income was $14,000.

While the sample of schools (n=2) was too small to test a theory about the impact of population exchange, it is interesting to note that many of Kelly's predictions did seem to be supported in the two schools. The social structure at School A was quite fluid and informal compared to the more formal and impersonal climate at School B. Cross-sectional data showed that male and female students in School A reported a greater number of interactions with school adults and that these interactions occurred in more settings and in a wider variety of settings (P. Newman, 1971). The longitudinal sample of young men in School A reported a greater number of interactions with school staff, a greater number of friends in school, and that school staff were helpful and friendly. In contrast, the atmosphere at School B was more structured and interactions there were more related to classroom roles. The important point, however, is that since these differences, whatever their source, did exist, the study provided an opportunity to look at the process of adaptation for students in two quite different environments.

The measures. Nine variables, collected as part of a larger study on adapatation to varied high school environments (Kelly, 1978), were selected as indicators of psychological health. This list was not meant to be either inclusive or representative of the universe of items

measuring psychological health, but it was felt to provide a reasonably broad sample of attributes related to the concept (Coan, 1974). The variables included: (1) Self-esteem -- a 10 item scale (coefficient Alpha [Cronbach, 1951] = .81) adapted from Rosenberg (1965) which was a general measure of perceived "worthiness of self" and consisted of items such as "I am a useful person to have around," or "Sometimes I think I am no good at all;" (2) Self-dissatisfaction -- a 10 item scale (Alpha = .75) measuring dissatisfaction with one's personality and the way one gets along with others; (3) Desire for role change -- a 7 item scale (Alpha = .88) measuring desire to change one's performance in different roles, such as student, friend, or worker; (4) Desire for physical change -- a 5 item scale (Alpha = .82) measuring desire to change one's height, strength, and appearance; (5) Social problems -- a 5 item scale (Alpha = .66) indicating difficulty in interpersonal relationships; (6) Aggression -- a 16 item scale (Alpha = .93) developed by Klingel (Note 1) indicating the frequency of aggressive behaviors against teachers and peers. The scale consisted of items asking respondents how many times in the last six days they had "argued with a teacher" or "said something just to bug another youth;" (7) School deviance -- a 10 item scale (Alpha = .77) indicating the frequency with which respondents engaged in disruptive behaviors in the school such as fighting, skipping classes, and damaging school property; (8) Psychosomatic symptoms -- a 4 item index (Alpha = .71) adapted from a larger checklist of physical complaints used by Gurin, Veroff, and Feld (1960), indicating the frequency of difficulties with sleep, headaches, eating, and upset or

nervous stomach; and (9) Depression -- an 8 item index (Alpha = .78) indicating how often one experienced feelings of depression. The scale consisted of items such as "I feel I have a lack of enthusiasm" and "I have trouble concentrating on something until it is finished." Factor analysis (Hersey, 1977) indicated that these variables loaded on three dimensions: a "self-concept" factor (with high loadings by self-esteem, self-dissatisfaction, desire for role and physical change, and social problems), a "disruptive behavior" factor (with loadings for aggression and school deviance), and a "subjective distress" factor (with loadings for depression and psychosomatic symptoms). A listing of individual items, and more detailed information on variable construction and sampling procedures can be found in Edwards (1971).

Design and Analysis. Two-way analysis of variance (MANOVA, ISR, 1973) was used to test the hypotheses. Two high schools and three levels of exploration (low, moderate, and high) were used as independent variables and the dependent variables were the nine indicators of psychological health. Since the study was interested in how preference for exploration might affect later adjustment, exploration groups were selected on the basis of their eighth grade scores and the indicators of psychological health treated as dependent variables were measured in twelfth grade. Ninety-two male students were included in this analysis and cell frequencies ranged from 12 to 18.

Results

Main effects. There were significant main exploration effects for self-esteem ($F[2,91] = 5.93$, $p<.01$) and deviance ($F[2,91] = 4.18$, $p<.05$) Self-esteem scores were significantly higher for students with a high exploration preference, while the frequency of school deviance was highest for the moderate exploration group. There were no significant main school effects.

Interaction Effects. There were significant School X Exploration interaction effects for psychosomatic symptoms ($F[2,76]=4.07$, $p<.05$) and self-dissatisfaction ($F[2,74]=3.78$, $p<.05$). The mean differences betweeen groups were in the hypothesized direction. In School A (the more fluid setting) high explorers reported a lower rate of psychosomatic symptoms (and a lower level of self-dissatisfaction) than did the low exploration group. In School B (the more constant setting) the opposite was the case, and high explorers reported a higher frequency of psychosomatic symptoms (and a higher level of self-dissatisfaction) than the low exploration group. The frequency of significant interactions (2/9) was higher than would be predicted by chance, and it is interesting that the strongest finding was with psychosomatic symptoms, the variable in this study which might be considered the most reliable indicator of psychological health.

Table 1 Goes About Here

Investigation of Assumptions

Measurement and design

In pursuing the meaning of these findings, it was decided to examine the assumptions on which the hypothesis was based. First, it was assumed that in a fluid environment high explorers would be more apt than low explorers to seek out and develop positive relationships with school adults and with peers, while in a more constant environment this would not be the case. This was tested by looking at the frequency and quality of relationships with peers and adults. Two measures of interpersonal relationship (Bennis, 1964)--affective interaction and instrumental interaction -- developed by McClintock (1972) and administered in eleventh grade, were chosen to assess the quality of relationships. Affective interaction was an indicator of the extent to which a relationship with another provided pleasure and satisfaction as an end in itself and was measured by the extent to which respondents indicated they enjoyed being with, liked talking to, and joked or horsed around with teachers and peers. Instrumental interaction provided skills or assistance and was measured by items such as others "help you" or "teach you things you consider important."

The next assumption was that in a fluid school environment (but not in a constant one) high explorers would be more apt than low explorers to become involved in classes and school activities. This was measured by a four item self-report scale indicating the degree of class involvement, ("How often do you ask a question in class?...Do things you

enjoy in class?"), and a measure of school group orientation ("How much do you feel a part of the school?..School activities?).

The final assumptions were that in a constant school environment high explorers would be more apt than low explorers to resent the structure of the school and be labeled deviant by school adults. These assumptions were tested using a 10 point ladder scale indicating satisfaction with school, and ratings by the assistant principals on the extent to which students were perceived as discipline problems.

The assumptions were tested by analysis of variance of exploration groups within each school. When the variables were assessed in earlier grades, these were included in the analysis, in order to gain a clearer sense of the dynamics involved.

Results

The analysis of variance found significant differences among exploration in the quality of, but not in the quantity of, interactions with school adults. In School A (the more fluid setting) high exploration groups reported significantly higher levels of affiliative interaction ($F[2,47]=3.80$, $p<.05$) and instrumental interaction ($F[2,47]=4.05$, $p<.05$) with school adults than did the low exploration group. In School B, on the other hand, there were no significant main effects for exploration on those variables.

Similar results seemed to occur for peers. While there was no significant difference in the number of close friends that the different exploration groups reported at School A, there did appear to be

differences in the quality of interactions with peers. In School A, high explorers reported a higher degree of affiliative interaction ($F[2,46]=4.43$, $p<.05$) and instrumental interaction ($F[2,47]=3.08$, $p<.05$) with school friends than did other exploration groups. In School B, this was not the case, though in eleventh grade the tendency for moderate explorers to report more close friends than the high or low exploration groups was statistically significant ($F[2,40]=4.15$, $p<.05$).

The next assumption was that exploration might differentially influence the level of involvement in school. This was not the case. Rather, in both schools (not just in the fluid setting) exploration was significantly related to class involvement ($F[2,47]=3.85$, $p<.05$ in Grade 10; $F[2,45]=5.05$, $p<.01$ in Grade 11; $F[2,43]=3.33$, $p<.05$ in Grade 12 at School A; $F[2,47]=4.14$, $p<.05$ in Grade 10; $F[2,43]=4.48$, $p<.05$ in Grade 11 at School B). On the other hand, the data indicated that the main exploration effect was significant for School Group Identification at School A ($F[2,47]=3.33$, $p<.05$ in Grade 10; $F[2,47]=5.70$, $p<.01$ in Grade 11; $F[2,43]=8.59$, $p<.01$ in Grade 12), but not in School B.

The final assumptions were that in the constant school setting high explorers would be more apt than low explorers to be dissatisfied with school and labelled as deviant. This did not seem to be the case. Rather, high explorers reported a higher level of satisfaction with school in both settings in Grade 10 [$F(2,47) = 3.12$, $p<.05$ at School A; $F(2,47) = 4.83$, $p<.05$ at School B] and the differences between the group were not statistically significant in Grades 11 and 12. In neither

school was exploration related to assistant principal ratings as a discipline problem.

Table 2 Goes About Here

Discussion

There appeared to be several effects going on in this study. On one hand, high explorers in both settings tended to be high in self-esteem -- a relationship that may have been mediated by the level of involvement in school. On the other hand, exploration appeared to interact with the fluidity of the school environment in its influence upon psychosomatic symptoms and self-dissatisfaction -- thus providing support for the person-environment interaction hypothesis. This interaction may have been mediated by the quality of relationships with school adults and school peers in the two environments. In neither setting was exploration related to aggression or school deviance. It is possible, of course, that the findings on interaction ocurred by chance, though the probability of this (2/9 significant interactions in the hypothesized direction) is less than .05. Moreover, it is possible that the reason that more interactions were not significant is that the other variables were not as robust. Seven of the measures treated as dependent variables had been developed especially in this study, so it is interesting that significant interactions were found just for the new variable with the most items (self-depression was a 10 item scale) and

for psychosomatic symptoms, the measure with lengthy credentials as an indicator of psychological health.

There may have been other reasons why the evidence of person-environment interaction was not as widespread as predicted. First, the differences in the social environments, while significant, were not extreme, and it is possible that a larger difference in social climate would have resulted in stronger evidence for interaction. Second, as the findings indicated, the measure of exploration was not a pure indicator of the concept. The scale contained items about exploratory behavior within the school environment, so it was not surprising that exploration was related to class involvement. It is possible that this multicollinearity may have somewhat obscured interaction effects.

The other limitation of this study is that it does not clearly specify the nature of causality, and it is possible that a third, perhaps unmeasured, variable accounted for the interaction effects. The study of the relationships of exploration with perceptions of the school environment was a step in this direction but they do not rule out the impact of unmeasured variables, and since several key variables (psychosomatic symptoms, affective interaction) were not measured longitudinally it was not possible to use cross-lagged correlations to explore the direction of influence. In this sense, then, these findings should be considered tenative until they can be verified experimentally.

Yet despite these limitations, the study clearly suggests the importance of exploration as a coping style that can influence the

process of adaptation to institutions. It also suggests that the impact of this coping style may be influenced by the population exchange rate and the fluidity of social settings. The study suggests that in a high exchange environment, an appropriate intervention strategy might be to focus on providing structure to give direction to low explorers and youth entering the environment. In a more constant environment, one might want to work with faculty to provide support for the more diverse needs of students. In short, the study highlights the utility of person-environment interaction as a strategy to conceptualize the process of preventive intervention in different social environments.

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Footnote

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Table 1

Summary Table of Means in Two-Way Analysis of Variance for School and Exploration Level in Twelfth Grade

VARIABLE	SCHOOL			EXPLORATION				SCHOOL X EXPLORATION						
								SCHOOL A			SCHOOL B			
	Sch A n=46	Sch B n=46	F	Low n=31	Med n=33	High n=28	F	Low n=16	Med n=12	High n=18	Low n=15	Med n=16	High n=15	F
Self-Concept														
Self-esteem	36.0	38.3	3.83	35.0	36.6	39.9	5.93*	34.1	34.8	39.2	36.0	38.4	40.6	.54
Self-dissatisfaction	29.4	29.1	.03	30.9	30.5	26.3	1.2	34.6	32.2	21.4	27.3	28.8	31.2	3.78*
Role change	23.2	22.7	.07	23.9	23.0	22.1	.31	24.3	24.3	21.3	23.6	21.7	22.9	.39
Physical change	16.7	14.3	2.86	16.4	16.2	13.8	1.97	17.8	17.8	14.7	15.4	14.7	12.9	.07
Social problems	16.2	14.6	2.27	16.6	15.8	13.8	2.70	17.6	16.0	15.1	15.7	15.6	12.6	.36
Subjective Distress														
Depression	31.1	28.9	1.21	29.8	32.4	27.9	2.23	31.2	33.6	28.6	28.3	31.3	27.3	.08
Psychosomatic Symptoms	14.4	14.6	.07	14.1	14.6	14.9	.72	13.6	13.7	16.0	14.6	15.6	13.8	4.07*
Disruptive Behavior														
School Deviance	14.4	15.0	.85	13.2	16.9	15.2	4.18*	13.5	18.3	11.5	13.0	16.9	15.2	1.51
Aggression	3.03	2.49	.63	3.50	2.74	2.05	2.08	4.00	3.41	1.68	3.00	2.07	2.42	1.10

* Significant at a .05 level/** Significant at a .01 level

Table 2

SUMMARY TABLE OF MEANS IN ONE-WAY ANALYSIS OF VARIANCE

FOR EXPLORATION LEVEL IN SCHOOL A AND SCHOOL B

		SCHOOL A				SCHOOL B			
	GRADE	LOW n=16	MOD n=12	HIGH n=18	F	LOW n=15	MOD n=16	HIGH n=15	F
School Adults:									
Number of	10	9.2	8.6	10.2	.20	4.8	9.1	9.1	1.59
Interations	11	7.0	6.3	11.7	2.9	9.9	9.5	10.9	.15
	12	6.6	19.3	9.4	1.36	8.9	23.5	7.5	1.01
Affective Interaction	11	14.2	16.7	18.7	3.80*	13.3	13.8	17.8	.18
Instrumental Interaction	11	18.4	19.7	22.2	4.05*	18.4	18.5	19.3	.44
Peers:									
Number of	10	8.7	12.4	13.2	.76	12.5	19.6	16.6	.29
Close Friends	11	2.68	3.35	3.26	.49	2.00	3.57	2.28	4.15*
	12	8.9	16.8	23.9	2.25	9.4	14.7	13.5	.32
Affective Interaction	11	21.9	23.6	25.8	4.43*	23.8	22.1	24.4	.84
Instrumental Interations	11	15.6	18.5	19.3	3.08*	16.1	15.9	17.4	.20
Class Involvement	10	16.2	14.2	18.7	3.85*	14.0	14.3	18.1	4.14*
	11	14.4	15.4	19.8	5.50**	14.1	15.2	18.9	4.48*
	12	14.2	19.1	19.3	4.23*	14.6	15.5	17.8	2.28

Table 2 Continued

		SCHOOL A				SCHOOL B			
	GRADE	LOW n=16	MOD n=12	HIGH n=18	F	LOW n=15	MOD n=16	HIGH n=15	F
School Group	10	10.8	11.7	13.6	3.33*	10.2	10.3	12.3	2.96
Identification	11	11.4	13.8	15.1	5.70**	10.6	10.3	12.5	2.29
	12	11.1	10.4	14.1	8.59**	10.7	11.1	11.1	.10
Satisfaction	10	6.25	5.37	7.36	3.12*	5.93	4.83*	6.56	1.90
With School	11	6.71	5.91	6.94	.66	4.62	5.31	6.78	2.46
	12	6.58	4.90	6.60	1.22	5.61	5.75	5.06	.25
Assistant Principal Discipline Rating	12	22.3	21.5	19.4	.31	21.4	15.8	20.2	.90

*Significant at a .05 level.

**Significant at a .01 level.